The Disinfecto.

A semiautomated sanitising robot!

My Team, Disinfecto
is developing a Robot
to help Workplaces
solve Sanitation problem
with Disinfecto

PROBLEM STATEMENT

The world is facing COVID-19. The virus affects every human being. The problem we are focusing on is sanitising.

Sanitising places is necessary, we can't depend on human workers for sanitising the places .

We need a more reliable machine/robot which helps to sanitize workplaces or hospitals and that's where DIS-INFECTO comes in.

Problem Validation

THE NEW INDIAN EXPRESS

Sanitation workers, attendants most vulnerable to Covid-19 among hospital staff: AIIMS study

By Sumi Sukanya Dutta | Express News Service | Published: 10th August 2020 07:59 PM

THE HINDU

NATIONAL

Little protection for sanitation workers during COVID-19 pandemic, finds survey

Who has the **Problem**?

-Risking **sanitary workers** lives.

-Risking **people working in offices** if the sanitary worker is asymptomatically covid positive

-**Insufficient manpower** for sanitising in hospitals

-**The company spaces, educational institutes, offices and hospitals** which requires sanitising workspaces

Current Solutions

-Sanitiser stands

- Hire more people and train them and provide them with masks and other protective equipment which can be risky and very expensive.

Our Solution-

Disinfecto is a robot . It is a roomba like robot moving around the workspace releasing fumigation gas in the hallways and disinfecting hotspots like door handles via image recognition.

Which can also be controlled with our phones just like RC cars

Head releases the sanitising liquid to be sprayed on hotspots such as elevators and door handles

Rotatable and retractable neck can go up and down or can rotate sideways

Storage tank is where the sanitising liquid such as BSL4 is stored

Aerial Fumigation-Releases sanitising gases using ultrasonic atomiser which helps in sanitising the air and the surfaces

Houses the machinery such as battery and microcontroller

This part helps the bot to move around

→ Resources and technology needed

1. Jumper wires
2. Wheels 3.

Side shaft motor

4. ESP 32 CAM
5. Ultrasonic atomizer
6. Pipes
7. Nozzle spray
8. L clamps
9. Rack and pinion
10. Chassis

1. Ultrasonic sensor

12. Li - ion battery

13. Servo moto

r 14. L298n motor driver

15. 12 v DC PUMPS

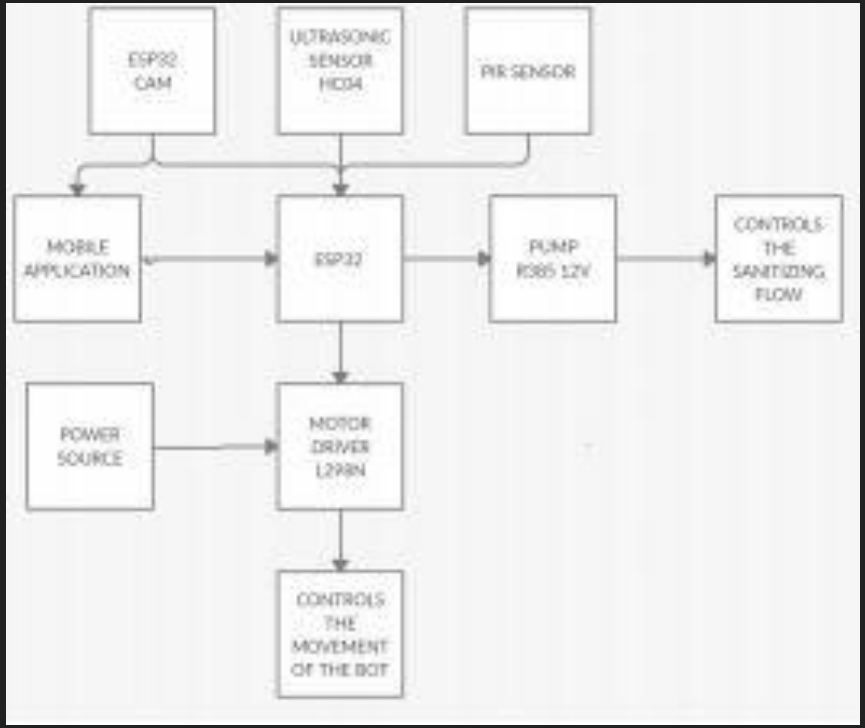
16. Relay module

17. Miscellaneous parts

18. Laptop and software

19. Fogger liquid

Block diagram



WORKING:

The standard subject of the bot is to reduce the human's involvement in the disinfection(sanitization) in areas like clinical concentrations , work places,etc Our robots contains camera(for Image Processing), rack and pinion gear and Pump (for sanitization) . Our robot has two modes.

In the first mode robot is Manual mode

. For manual mode you need to control where the bot goes with your phone or a controller just like RC car

WORKING :

The standard work of our robot sanitizing portal handles via image processing with assistance of camera. In the wake of discovering area of door handles, Sanitization part gets dynamic then after adjustment of rack and pinion gear. By then with the help of Pump (which is useful for sanitization) decontaminating occurs.

In the second method of robot is full autonomous. For autonomous robot will work totally self-administering without any assistance during cleansing or during advancement . All the cycle happen will occur as notice above. This robot diminishes the peril on the transferring infection through door handles , railing, etc ., in this broad pandemic condition.

ALGORITHM

Step 1 - The bot moves around releasing sanitising gas and when the bot recognise the Door handles though image processing , then rack and pinion mechanism starts.

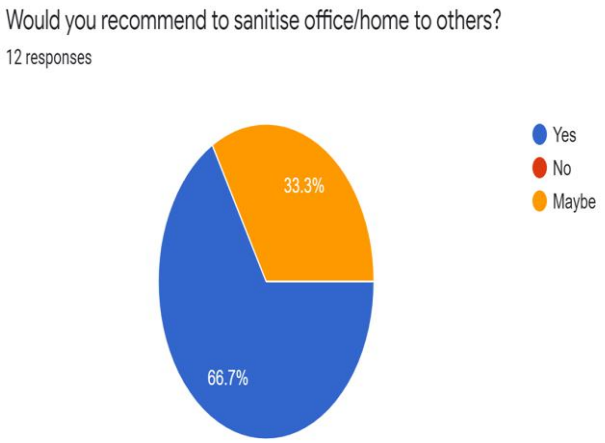
Step 2 - Then after the adjust the height according the door handles . And sanitization takes place .

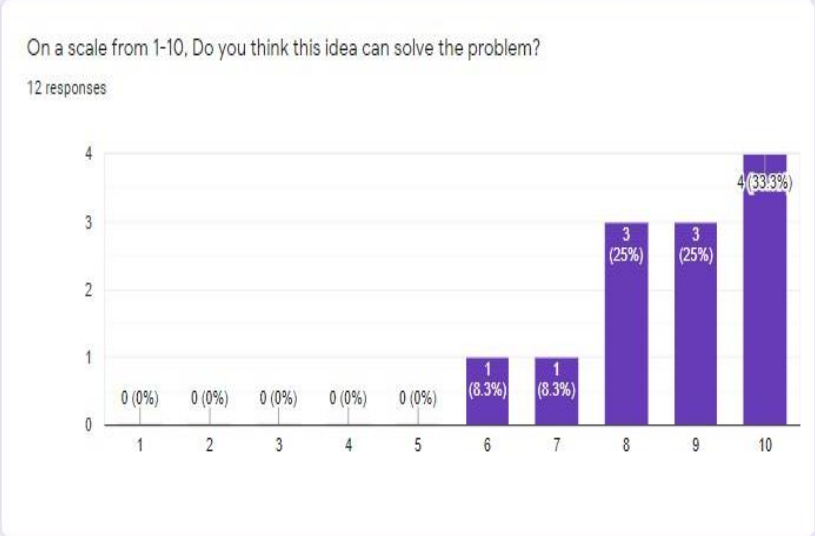
Step 3- After certain time rack and pinion gear will comes to initial position will stop again will active after identification of Door handles.

EXPECTED RECORD OF EXPENSE

S.NO	RECORD OF EXPENSES		
	COMPONENT	QUANTITY	PRICE
1	JUPMER WIRES	-	50
2.	ULTRASONIC SENSOR	1	100
3.	SERVO MOTOR	1	90
4.	ESP 32 CAM	1	850
5.	R385 12V PUMP	1	170
6	PIR SENSOR	1	70
7	L298N MOTOR DRIVER	1	125
8.	WHEELS	4	320
9	ULTRA SONIC ATOMIZER	1	400
10	SIDE SHAFT MOTOR	2	768
11	PIPE(D=2MM)	1	50
12	NOZZLE SPRAY	1	10
13	L CLAMPS	-	70
14	LI ION 2200MAH (12V) BATTERY	1	800
15	ACRYLIC(CHASSIS)	-	300
14.	Relay	1	70
		TOTAL	4,133

Public Survey





Future Enhancements

- To detect high temperature anomalies in humans around the bot
- Mask detection
- To count the number of people in a room

Benefits:

-No Human interaction

-Eliminates the spreading vector possibility by using robot

-5L of Bsl4 liquid costs 3000 rupees which is dissolved into 500 liters of sanitising liquid which works for multiple months

-Lower costs

-Lower manpower